Temperature variations and the effect on fish predation

Student Handout / Lab Sheets:

Name _____ Period _____ Date _____

Observations: Given a fish with something(s) to eat, list the factors influence the rate at which a fish consumes the food.

Problem: If the temperature of the water is varied, how will that affect the number and size of shrimp that the hungry fish consumes?

Hypothesis: _____

Design a test of hypothesis:

Materials: per group of students:

- thermometer
- timer
- tank
- fish
- several shrimp of two sizes (large and small)
- 5 containers for shrimp
- 2 micro-pipets

Jobs:
Two groups of students will do room temperature water. Three groups of students will do water of 28 C. Three groups of students will do 18 C.
In order for the fish to not be too stressed it is important that it be acclimated to the water and that the water kept at the temperature. One student will be responsible for monitoring the temperature and adding water slowly to keep the temperature constant.
Two students will be responsible for keeping the same number of small and large shrimp in the tank.
One student will be responsible for setting the timer, counting and recording the number and size of each shrimp consumed in the three minutes time.
Procedure:

- Use the pipets to divide out small and large shrimp placing the sized shrimp in two separate containers. Those larger than 7 cm count as large, and smaller than 7 count as small. Each group needs at least 20 of each size.
- Count out 10 of each size and place them into two small containers.
- Add shrimp to fish tanks at the same time and begin the timer.
- Count the number and size of each shrimp eaten. Record observations on the data chart.
- As each size of shrimp is eaten, replenish it with another shrimp of the same size.
- Continue for the three minutes of time.

Collect data from the other groups.

Test of Hypothesis:

Number and Size of Shrimp Consumed by the Fish in Water at Different Temperatures During a Three Minute Period

Size of Shrimp	Trials and Number of Shrimp Consumed				
	Trial # 1	Trial #2	Trial 3	Average	Calories* NA x C = CT
Small					
Large					
Small					
Large					
Small					
Large					

*Where NA is the average of the numbers, C is the calories for each size of shrimp and CT is the total calories from the shrimp.

Analyze Results:

Bar Graph of the Number of Shrimp Consumed for Each Fish at Each Temperature

Graph of Average Energy Consumed by the Fish at Each Temperature

Conclusion: Must include some statement relating the physical changes in temperature and the amount of energy consumed by the fish.

Report: